Difficult Airway Management and the Importance of the Introes Pocket Bougie™

A difficult airway is defined as the clinical situation in which a conventionally trained anesthesiologist experiences difficulty with facemask ventilation of the upper airway, difficulty with tracheal intubation, or both. The difficult airway represents a complex interaction between patient factors, the clinical setting, and the skills of the practitioner.

The importance of knowing when to intubate and what to do in the case of a technically challenging airway is not often appreciated. Several recent studies have highlighted the high failure rate for prehospital intubations as well as significant complications with this procedure.

Management of the Difficult Airway remains one of the most relevant and challenging tasks for anesthesia care providers.

ASA (American Society of Anesthesiologists) has recommended to limiting conventional intubation attempts to three in lieu of the considerable patient injury that may occur like hypoxemia, esophageal intubation, regurgitation, airway trauma, cardiac arrest, cerebral injury and mortality.

Did you know?

About 20% cases of airways are considered to be difficult. A high BMI (Body Mass Index) is one of the predictive measures of a difficult airway. Today’s obesity rate sits around 25-30% and unfortunately it’s only getting bigger. It’s been predicted that obesity rates in North America to hit 50% by 2040. The rate of difficult airways is going to get bigger! For instance, a normal adult male can withstand being without oxygen for about 4 mins without causing injury. However, an obese patient has less than 1 min.

A common factor preventing successful tracheal intubation is the inability to visualize the vocal cord during the performance of laryngoscopy. Direct Laryngoscopy (DL) is hard to create a line of sight. Video Laryngoscope (VL) technology has quickly become the go to device for visualization of the larynx but hard to pass an ETT (Endotracheal Tube).
Pre-ETT intubation airway evaluation can assist in determining whether the patient may present with a difficult airway:

- History and Examination
- Facial and/or maxillary trauma
- Protrusion of the mandible
- Short, large necks (bull neck)
- Broken teeth
- Oral infections
- Rheumatoid disease
- Suspected spinal cord injury
- Pregnant patients (third trimester, increased body mass)
- Small mandibles
- Overbite
- Morbidly obese
- Abnormally shaped face
- Oral and/or upper airway tumors
- Inability to open the mouth from obesity, deformity, injury

**Think L-E-M-O-N when assessing a Difficult Airway**

Prior to establishing a definitive airway, assess the patient’s anatomy to determine if you will have difficulty securing an airway.

**Look** externally. There may be some physical clue or foreign object that portends difficulty.

**Evaluate** using the 3:3:2 rule. Can the patient fit three fingers between the incisors? A mouth that can open that far has good temporomandibular joint mobility. Is the mandible length three fingers from the mentum to the hyoid bone? Last, the distance from the hyoid to the thyroid tells you something about neck length, two fingers' distance is ideal.
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## Mallampati Classification

![Mallampati Classification](image)

A   CLASS I   CLASS II   CLASS III   CLASS IV

Grade I: No problems/Class I: Vocal cords visible
Grade II: No problems/Class II: Vocal cords partially visible
Grade III: Moderate difficulty/Class III: Only epiglottis visible
Grade IV: Difficult/Class IV: Epiglottis not visible

## Cormack-Lehane Laryngoscopy Grades

B   GRADE I   GRADE II   GRADE III   GRADE IV

Obstruction. Look for anything that might get in your way. The enemies of airways include soft tissue swelling from smoke inhalation, burns, broken necks, trauma to the face or neck, foreign bodies in the airway, and excessive soft tissue from obesity.

Neck mobility is desirable. Unfortunately, many patients who need resuscitation in the emergency department arrive in neck braces or with compromised neck mobility, and you may not be able to move them into preferred positions for establishing a definitive airway.

What’s so magical about the bougie? Why the love affair?

One of the simplest, relatively inexpensive and most valuable devices to help with a difficult intubation

The bougie was first used by Robert Macintosh in 1943 when he encountered difficulty visualizing the vocal cords during ETT intubation. The term bougie originally described any flexible, slender, dilator-type device that was inserted into any body orifice for examination or dilation. The term was also used for wax candles, as bougie is an old French word for fine wax, originating from Bejaia (bougie), a city in northern Algeria. The current gum elastic bougies are not gummy or elastic, but rigid. The original reusable version is a fiberglass core covered in a beige resin and measuring 60 cm in length, with the distal tip having a 38° bend. Commonly used in the United Kingdom since the 1950s, it gained popularity with anesthesiologists in North America about 30 years ago.
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Studies have shown as high as a 99% success rate in ETT (Endotracheal Tube) placement when encountering an unexpected difficult airway. There’s four ways to confirm correct placement of the bougie. 1) Hang up at the carina/right main stream bronchi (if keeps on going most likely in the esophagus. 2) Tactile sensation of the tracheal rings. 3) Visual confirmation of bougie passing through the cords. 4) Confirmation with capnography once patient has been intubated.

The bougie has three distinguishing characteristics that make it a useful for ETT delivery. First, it has a smaller outer diameter than a tracheal tube. Most bougies are 5 mm (15 Fr); a tracheal tube of 7.5 mm inner diameter is almost twice as large in outer diameter as a bougie. Second, the upturned angled distal tip of the bougie, has an overall long axis dimension that does not exceed the dimensions of the trachea. The trachea is more narrow than most clinicians realize. In females, it is only 14–16 mm; in males, 15–20 mm. Because of the bougie’s flexibility and rounded distal tip, it usually passes into the trachea without hanging up on the tracheal rings. Finally, it’s tactile feel of the trachea on insertion.

Smooth solutions for difficult intubations...the Introes Pocket Bougie is well suited for use in the toughest environment settings of Hospital Facilities, Emergency Care and Rescue Services.

Superior Qualities:

**Single patient use.** Reduces the risk of cross contamination.

**Special blend of PTFE (Polytetrafluoroethylene).** Patented Tactiglide Technology; no lubrication required prior to insertion or threading the ETT. Faster intubation and reduced costs.

**Portability.** Designed to fit into an airway kit, EMS trauma bag for rapid access in critical situations.
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**Flexibility** with no metal core. Allows the distal tip to be flexed for the very anterior airway such as a grade 2 or 3 where the vocal cords are not clearly visible or in the event of using video laryngoscopy and the cords may be visualized but cannot successfully pass an ETT.

**Shape memory.** Can angle the distal tip for successful insertion and placement.

**Anatomical Curved Shaped.** To follow the natural path of the airway. Most bougies are packaged straight therefore difficult to store and impossible to access at all times.

**Innovative Depth Markings.** Excellent indicators of intubation depth at every 10, 20 & 30 cm on either end for patient safety. For an adult a bougie should never be inserted beyond 26 cm from the lips (mid-trachea).

**Versatile.** Used during ETT or tracheostomy exchange.

**Sized just right.** Adult, 60 cm length, 14 Fr (4.7 mm), fits a size 5.0 ETT, ideal for tight/narrow airways.

**Sterile.** Individual Packaging.

**Latex Free.** Contains no natural rubber

Avoid intubation troubles and don’t be surprised by a difficult airway. Preparation goes a long way in handling potentially difficult airway situations, whether it’s preventing emergencies from occurring or resolving the risks before they arise.

Make sure you have the Introes Pocket Bougie as part of your difficult airway plan!